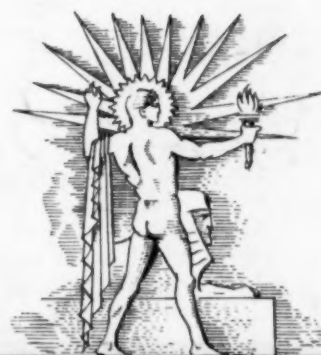


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# SCIENCE NEWS LETTER

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THE WEEKLY SUMMARY OF CURRENT SCIENCE •



November 29, 1941

Light for Liberty

See Page 345

A SCIENCE SERVICE PUBLICATION

## Do You Know?

The U. S. Army has evolved a time-saving way of *packing* Army clothing by baling it.

The Romans launched their *ships* by sliding them into the water on timbers greased with animal fat.

*Sawdust* from beech and alder trees is found satisfactory as a roughage element in diets of fish in hatcheries.

Heating *grapefruit* before it is pressed or canned removes most of the objectionable peel oil taste, Government scientists say.

Two American firms in Seattle and Alaska are experimenting with a start in the *king crab* industry in Alaskan waters.

Ways of reducing primitive languages to *writing* will be discussed at an institute of linguistics at the University of Oklahoma next summer.

Importance of *arc welding* in South Africa's war effort is recognized by issuance of a special postage stamp picturing a modern welder at work.

*Scales* used in checking filament wires in lamps are delicate enough to weigh a signature—"George Washington" written in pencil weighs .00089 grams.

More than one-fourth of the *steel* made in the United States and Canada for defense this year is coming from automobile junk yards and other scrap heaps.

## QUESTIONS DISCUSSED IN THIS ISSUE

Most articles which appear in SCIENCE NEWS LETTER are based on communications to Science Service, or on papers before meetings. Where published sources are used they are referred to in the article.

### ANTHROPOLOGY

What new archaeological find has been made in Virginia? p. 344.

### ARCHAEOLOGY

To what use have scientists put timber cut in the year 217? p. 341.

### ASTRONOMY

Where are this year's four Christmas stars? p. 346.

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Lack of what vitamin has been linked with tooth decay? p. 341.

### MEDICINE

Of what new use is a mold? p. 341.

To what injury are fat men prone? p. 349.

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### METEOROLOGY

How many stratospheres are there? p. 348.

### METEOROLOGY—GENERAL SCIENCE

In what ways are meteorologists contributing to national defense? p. 347.

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What is Pantothen? p. 344.

### PHYSICS

On what does the hardness of a plastic depend? p. 342.

What does the Arctic winter do to the atmosphere's "roof"? p. 340.

What new practical use has been found for heavy water? p. 345.

### POPULATION

How do statistics contribute to Russia's defense? p. 345.

### PSYCHIATRY

How can mental breakdowns in the armed forces be avoided? p. 343.

Why won't the returning soldier fit into a job held for him? p. 348.

Russia's Volga river and its tributaries are navigable for about 10,000 miles.

Supervised by Ohio State University chemists, WPA workers are making an index on research for new uses of *starch*.

China can send only limited quantities of *tung oil* to the United States now, but is accumulating large supplies for future export.

The surface around the *Grand Canyon* rim is rising at the rate of a few inches a century, and the canyon is cutting slowly downward, too.

Some states are saving *steel* by not issuing new automobile license plates, using instead dated inserts or cover strips or dated windshield stickers.

The *mourning dove* is a close relative of the extinct passenger pigeon.

A transparent plastic window in *surgical casts* is proving helpful in British treatment of bomb wounds and fractures.

Boy Scouts in Indiana are competing in a contest of gathering *tulip poplar* seed, to meet a shortage and an increasing demand.

An artificial lake on which troops can learn *pontoon bridge* construction is being made by the WPA at Indiantown Gap, Pennsylvania.

To prevent icing of *windshields*, one United States air line is installing a double windshield, between the layers of which heated air is kept moving.

## SCIENCE NEWS LETTER

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MEDICINE—BIOLOGY

# New Potent 'Flu Vaccine To Get Human Trials

**Influenza Virus Itself, "Seen" for First Time With Electron Microscope, Is Only 11 Millimicrons Across**

**A** NEW, powerful vaccine against influenza and pictures showing for the first time what the influenza virus looks like were announced by Dr. Leslie Chambers and Dr. Werner Henle, of the University of Pennsylvania's Johnson Foundation, at the meeting of the American Philosophical Society in Philadelphia.

First human trials of the vaccine, on several hundred volunteers, are scheduled to start this week. It is so powerful that a single shot quite regularly protects mice against 100,000 killing doses of influenza virus.

The 'flu virus itself, now seen for the first time with the aid of the electron microscope, was revealed as an unimaginably tiny spherical particle with a diameter of 11 millimicrons. This is so small that, placed side by side, enough of these particles to give influenza to about 500 mice could be covered by the period at the end of this sentence. This is based on the scientists' calculation that the minimal infectious dose is less than 100 particles.

The influenza A virus particle is one of the smallest disease-causing substances yet isolated.

The influenza virus had previously been believed to be about nine times this size. The larger particles which had been found in lungs of mice infected with influenza A are now believed to be components of normal cells which acted as carriers of the much smaller influenza virus particles.

The Philadelphia scientists isolated the true influenza virus particles from extra-embryonic fluids of developing hens' eggs that had been infected with influenza.

Chemical analysis showed the virus to be composed largely, if not entirely, of the kind of protein found in the nucleus of cells.

The virus was concentrated from the extra-embryonic fluids by spinning it for 90 minutes in an ultra-centrifuge with a force 90,000 times that of gravity, and by the addition of protamine, familiar to diabetics from slow-action protamine insulin.

The new vaccine, besides being remarkably effective in mice, has the advantage of being free from foreign proteins which might produce unfortunate reactions. It will be some time before its protective value for humans is known. Tested on mice, it showed greater efficiency than the vaccine developed by Rockefeller Institute scientists which, in trials during last winter's epidemic, cut down influenza among vaccinated persons to 50% of that among unvaccinated persons in the same institutions.

*Science News Letter, November 29, 1941*

## Chilling Develops Ova

**U**NFERTILIZED rabbit ova were caused to begin their pre-birth stages of development by chilling the entire bodies of unmated young female rabbits, in experiments reported before the meeting of the American Philosophical Society by Dr. Herbert Shapiro of Hahn-

mann Medical College. This carries scientific investigation of parthenogenesis, or fatherless birth, a long stride ahead.

Previous experiments by other investigators had resulted first in the initiation of development of rabbit ova in glass vessels outside the mothers' bodies, later in starting development after surgically opening the abdominal cavity and chilling the Fallopian tubes with cold-water jackets. The experiments now reported are the first in which development was started without resort to any surgical means whatever.

In Dr. Shapiro's laboratory, the rabbits' bodies were cooled by applying ice packs on their flanks, directly over the region of the Fallopian tubes. The rabbits had previously been anesthetized. Temperature, pulse rate and breathing rate were recorded at regular intervals.

The rabbits were turned temporarily into something resembling cold-blooded animals. Their normal body temperature, nearly 104 degrees Fahrenheit, was reduced to points varying from 92.5 to 66.4 degrees. The rabbits all recovered, apparently none the worse for their chilly experience.

The eggs were subsequently flushed out of the Fallopian tubes and sectioned for microscopic examination. None had progressed very far in development, but three had undoubtedly at least been started. Two of them were in the two-cell stage, the third had undergone a considerable number of cell divisions.

*Science News Letter, November 29, 1941*



**"WORLD'S DEADLIEST FIGHTER"**

This new Curtiss Hawk P40F is so called by its designers because of its fire power (60,000,000 foot-pounds per minute at the muzzle), its speed and its high altitude performance. It is the first American warplane powered with the American-built Rolls Royce. The photograph has been retouched so as not to show any armament.



## Atmosphere Loses "Roof"

THE "ROOF" of the atmosphere, where the stratosphere begins, is lost completely when the long, desperately cold night of the Antarctic winter settles down, Arnold Court of the U. S. Weather Bureau told the meeting. This winter disappearance of the tropopause, as the lower boundary of the stratosphere is known, has never been reported from the Arctic, despite very many measurements taken in Arctic regions. None of the Arctic stations, however, is as close to the North Pole as Little America is to the South.

The tropopause is defined as the level at which temperature ceases to decrease with greater altitude. Normal summertime height in the Antarctic is about nine kilometers (5.6 miles), with a temperature of -50 degrees Centigrade (58 degrees below zero Fahrenheit). Above that level the temperature in the stratosphere rises again, reaching a steady point at about -40 degrees Fahrenheit.

Under Antarctic winter conditions, however, the temperature keeps right on dropping as the radiosonde balloons explore higher and higher, detecting no tropopause at all. Lowest temperature recorded was -80 degrees Centigrade, or 112 degrees below zero Fahrenheit.

*Science News Letter, November 29, 1941*

## MEDICINE

# Common Unrecognized Disease May Be Cause of Lung Ills

## Causes Tiny Limestone Formations in the Lungs and Is More Prevalent in Areas Near Appalachian Plateau

A COMMON but not yet recognized disease has been shown by U. S. Public Health Service scientists to be the cause of tiny limestone formations in the lungs previously thought due to tuberculosis.

Because physicians have taken these tiny spots shown up on X-ray plates to be due to tuberculosis lesions that have been cured, the new findings will probably cause a change in medical diagnosis of many cases.

Curiously, the disease is highest in areas where there are extensive limestone and chert formations, that is, in areas adjacent to the Appalachian Plateau.

These observations, made by other scientists, aroused the Public Health Service to make an independent study. It selected Ross County, Ohio, an area adjacent to the Plateau, where lung calci-

fication is common, but tuberculosis fatalities not above ordinary. Rural families were selected in order to rule out as far as possible contacts with tuberculosis outside the household.

More than 200 persons in 44 farm households were X-rayed and tuberculin tested. Of 253 persons effectively X-rayed, 125 showed the limestone formation in the lungs—but none had significant tuberculous lesions.

Of 235 who were tuberculin tested, 194 were negative. Fifty-six persons with negative tuberculin tests show lung calcification. The studies were made by Dr. B. J. Olson, passed assistant surgeon, Dr. W. H. Wright, chief of the division of zoology, and M. O. Nolan, associate zoologist, all of the Public Health Service.

The existence of an unrecognized disease of very common occurrence is suggested by these investigators. It appears to produce the lung lesions closely resembling the X-ray picture of primary tuberculosis. They believe, therefore, that the finding of lung calcification particularly in tuberculin-negative persons should not be assumed to be evidence of tuberculosis infection.

With tuberculosis apparently ruled out, the Public Health Service scientists next considered the ascariis as a possible cause of the lung calcifications. Ascariis is a tiny, parasitic worm, which in the larval stage may damage the human lung. Careful study, however, failed to prove or disprove that ascariis was guilty.

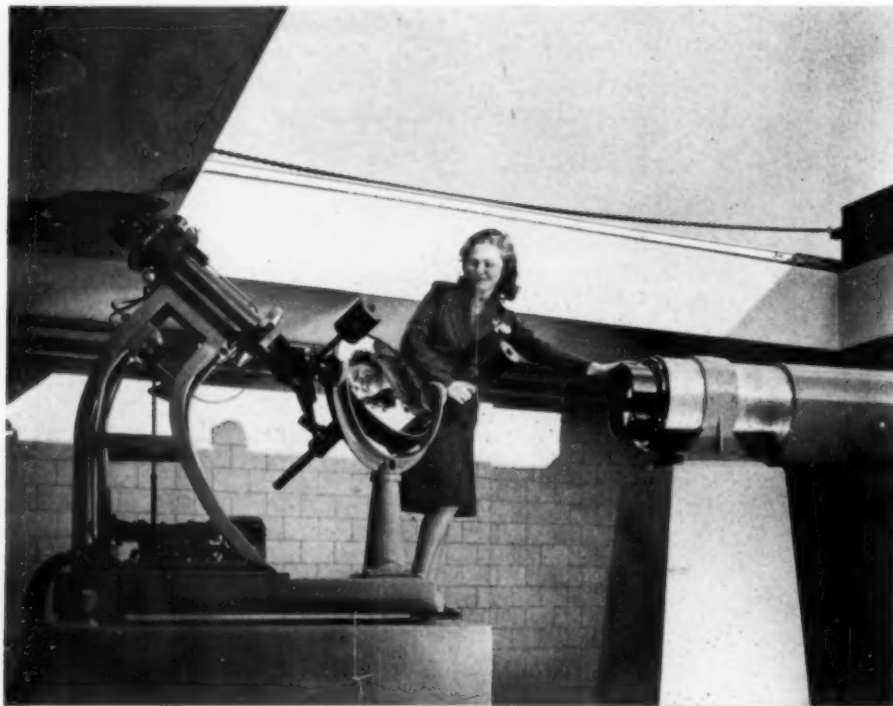
*Science News Letter, November 29, 1941*

## ASTRONOMY

## People's Observatory Dedicated in Pittsburgh

THE PEOPLE of Pittsburgh now have a telescope all their own. The new \$30,000 People's Observatory of the Buhl Planetarium will be used by the public and not by professional astronomers. Its siderostat telescope is the second such instrument in America.

The observatory itself is half outdoors, where the telescope is, and half indoors, where the star-gazers do their looking in



TELESCOPE FOR PITTSBURGH PEOPLE

*It is this mirror which locates and follows the stars being viewed with the new siderostat telescope. The reflection is carried to another room where it is viewed.*

steam-heated comfort. The telescope tells its own story because a special sound system brings a running description of the view of the heavens.

Unlike the conventional telescope, the viewing end of the siderostat stays still while the 18-inch mirror locates and fol-

lows the stars being viewed. The idea of the siderostat telescope was first proposed some 80 years ago by the French scientist, Leon Foucault.

Dr. Harlow Shapley, director of the Harvard College Observatory, delivered the dedicatory address.

*Science News Letter, November 29, 1941*

#### DENTISTRY—NUTRITION

## Tooth Decay and Pyorrhea Linked to Lack of B Vitamins

### Dental Decay Found To Develop in Dogs Lacking Filtrate Factor of B Complex That Is Still Not Understood

**T**OOTH DECAY, one of the commonest of dental diseases, may be due to a deficiency of some of the vitamins in the B group, it appears from laboratory experiments reported by Dr. Hermann Becks, professor of dental medicine at the Hooper Foundation for Medical Research, University of California, and Dr. Agnes Fay Morgan, professor of home economics at the University.

Dogs on a diet lacking one of the B vitamins developed tooth decay, normally absent in dogs, Dr. Becks found. The B vitamin lacking was the filtrate factor. Its function is still unexplained.

When the dogs' diet was deficient in nicotinic acid, the animals developed pyorrhea and severe bleeding of the gums. A third, or control group, on a balanced diet, developed no decay or pyorrhea.

Dr. Becks makes no attempt to fit his findings to human tooth decay since he worked only with dogs.

"On the other hand," he points out, "clinical experience has already produced excellent results with certain vitamin B fractions in the treatment of Vincent's disease, an infection of the mucous membrane, and other inflammatory diseases of the mouth. Ulcer formations of the tongue and inside the cheek have been successfully treated by the administration of nicotinic acid."

Dr. Becks said that the experiments provide a most encouraging link between carbohydrates and dental decay.

The body converts carbohydrates into sugars. It is well known that vitamin B is necessary for the correct assimilation of sugars. However, a large percentage of the foods of the modern diet have the vitamin B removed in processing.

This leaves the body, including the teeth, without protection against the harmful effects of sugars which do not contain vitamin B.

Dr. Becks and other research dentists have shown that there is a direct relationship between tooth decay and a bacillus, called *Lactobacillus acidophilus*. The number of bacilli found in the mouth has been found to be in direct proportion to the amount of sugars and carbohydrates consumed, that is, sugars and carbohydrates which have the vitamin B removed in processing.

Dental decay, like the common cold, is one of the unsolved problems. The American Dental Association has provided a fellowship for dental research at the National Institute of Health, research arm of the U. S. Public Health Service, to help solve this problem.

*Science News Letter, November 29, 1941*

#### ARCHAEOLOGY

## Timber Cut A.D. 217 Gives Oldest Building Date

**T**IMBER that Utah Indians felled with stone axes back in A.D. 217 provides a new date for America's ancient history—the oldest building construction date in the Southwest yet undetermined by science.

Antiquity of the historic piece of building wood is reported by W. S. Stallings, Jr., of the Laboratory of Anthropology, Santa Fe, after comparing the sequence of annual growth rings in the timber with the famous tree-ring calendar that scientists have evolved to date Indian ruins in this part of America. (*Tree Ring Bulletin*, July).

The timber was part of a pinyon pine that grew more than a century and, from center to outer bark, has tree rings

representing the years A.D. 91 to 216. Indians of the Basketmaker Two period of ancient America used this pinyon piece in roofing a storage pit in du Pont Cave, where a group of them lived near what is now Kanab, Utah.

Exploring this old Indian settlement 21 years ago, for the Museum of the American Indian in New York, archaeologist Jesse L. Nusbaum hid away some pieces of the building wood, thinking they might be scientifically valuable some day. His foresightedness was rewarded when scientists reported success in matching and overlapping patterns of annual growth rings of trees to form a chronology for dating Indian ruins of the area through many centuries.

When opportunity offered, Mr. Nusbaum returned to the cave and dug out of his squirrel-like cache the five pieces of Indian timber he had hidden. Just one—the piece of pinyon pine—has provided tree-rings that can be read well enough to show when the Indian builders lived in the cave and constructed, or repaired, their store pits for food.

*Science News Letter, November 29, 1941*

#### MEDICINE

## New Weapon Against Germs Obtained from Mold

**A** NEW substance capable of stopping the growth of a wide variety of disease germs, including those of typhoid fever, dysentery and cholera, has been obtained from a mold, probably belonging to the genus *Aspergillus*, Dr. G. A. Glister, of the University of Oxford, reports. (*Nature*, Oct. 18).

In test tube experiments the new substance was effective in a dilution of about 1:200,000. It has a wider range of antibacterial activity than penicillin, germ-killing substance from another species of mold recently isolated by Dr. A. Fleming, of St. Mary's Hospital, London, and already shown to have value as a remedy for germ-caused diseases.

Use of the newest mold chemical in treating patients is not mentioned in the report, but the test-tube experiments indicate that it may be a weapon against not only the germs successfully attacked by penicillin but also against those of the gram-negative group which include the germs of Shiga dysentery, typhoid and paratyphoid fevers, and cholera.

Whether the substance is related to the germ-killer found in the mold, *Aspergillus flavus*, by an American scientist, Dr. E. C. White, of the Johns Hopkins Hospital, is not yet known.

*Science News Letter, November 29, 1941*

## PHYSICS

# Same Plastic May Be Made Hard or Soft, X-Ray Shows

**It All Depends on the Orderly or Disorderly Array Of Its Molecules; Compromise Between Extremes Better**

**T**HE SAME plastic may be hard or soft according to the orderly or disorderly arrangement of its molecules. This was disclosed by X-ray investigations made in the Bell Telephone Laboratories by W. O. Baker, C. S. Fuller and N. R. Pape.

The molecules of a plastic are very large, thousands of times larger than those of water or gasoline. They are long and threadlike, being composed of many atoms strung in a row, and so are called chain molecules or polymers.

If the molten plastic is rapidly cooled and quenched, the X-rays revealed that the molecules are in a very disorderly state, as though the rapid solidification had not given them time enough to arrange themselves in a more regular fashion. The plastic is then soft and flexible.

If, however, the plastic is slowly cooled, the molecules do arrange themselves in a quite orderly fashion. They do not all face in the same direction, as in a single crystal, but in groups, the members of which all face in the same directions while the groups face in different directions. The plastic is then hard and strong, but may also be brittle.

Evidently a compromise between these extremes is to be desired. Hardness and strength must be combined with toughness rather than with brittleness. This goal can be attained, the studies showed, by regulating the quenching treatment so as to give the right proportion of ordered to disordered molecules. If a plastic comes out too soft, it can be hardened by moderate reheating and slow cooling.

This last operation brings out a striking difference between plastics and other solids, namely, that the molecules of a plastic even in the solid state can, to some extent, move about into a more orderly arrangement. In most other solids it is believed that the molecules are fixed and do not move from their positions until the melting point is reached.

This limited mobility of the molecules of a plastic even in the solid state, the

investigators believe, is related to the curious property of "lazy" recovery when the plastic is deformed. It does not snap back like a steel spring, but returns slowly and at a decreasing rate—strikingly exemplified by vinyl plastics.

*Science News Letter, November 29, 1941*

## AERONAUTICS

## High Flying Airplanes Are Made Safe By Tests

**B**Y SPINNING the rotors of the super-charger and other metal wheels in a vacuum up to 1,000 revolutions per second, or until they fly apart, our bomber planes are being made safe for

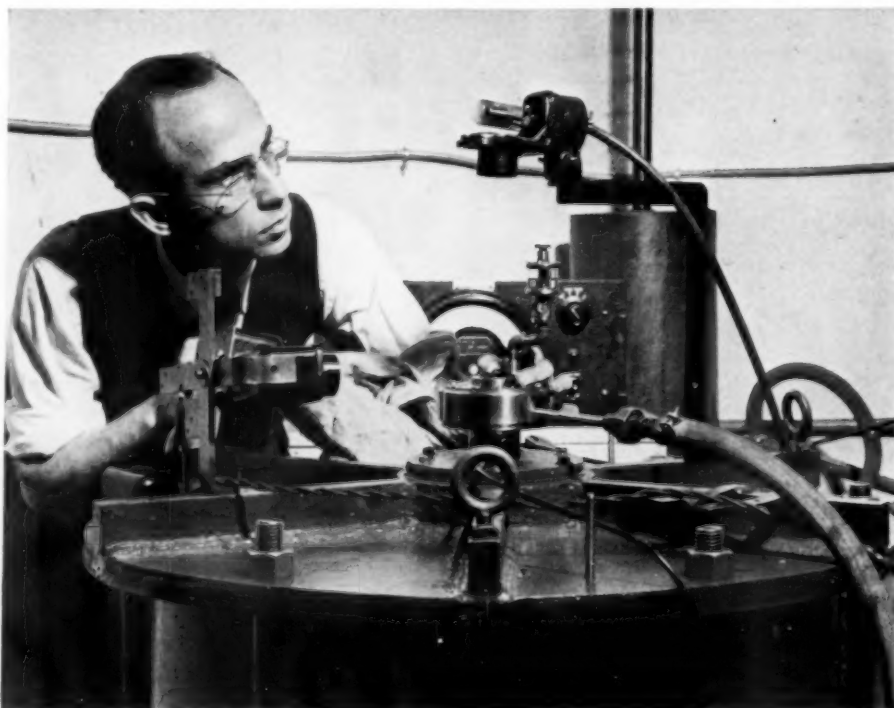
high altitude flying. The tests are being carried out by scientists at the General Electric Research Laboratories.

The wheels, weighing as much as ten to twenty pounds and a foot or more in diameter, are the largest and heaviest ever driven at this terrific speed, the scientists say. Every pound of metal on the rim exerts an outward pull due to centrifugal force of over 100 tons.

When the wheel bursts, the fragments fly in all directions with speeds around 1,400 miles per hour. They have as much energy as the projectile of a small naval gun. The wheel literally explodes.

As may be imagined, the chamber in which the wheel is spun, is built with massive steel walls. These are sometimes lined with lead bricks to reduce damage to the fragments so that the nature of the fractures may be examined.

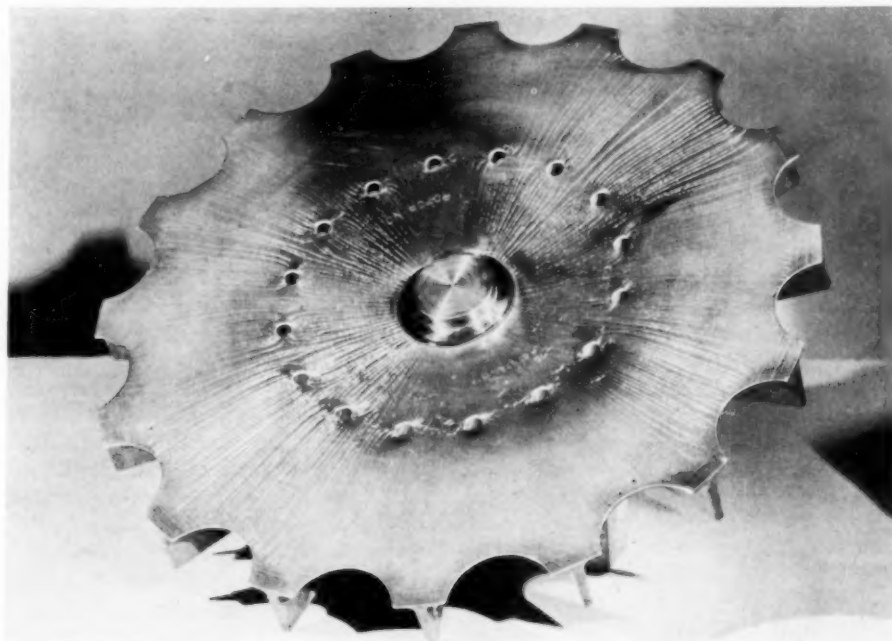
This chamber is exhausted of air to a pressure one ten-thousandth that of the outside air. The vacuum is necessary because otherwise the air resistance would be so great that thousands of horsepower would be necessary to overcome it. With the wheel in an almost non-resistant vacuum, a one-horsepower turbine,



### FOR TEST SPIN

*This machine spins wheels at high speeds up to 1,000 revolutions per second. The wheel is suspended in the tank, from which the air has been exhausted, shown at the bottom of the picture. On top of the tank is a small compressed air turbine that spins the wheel. Frank D. Quinlan, of the General Electric Research Laboratory, is looking at an electric eye which receives flashes of light from the spinning wheel by means of which the speed of rotation is determined.*





## TEST RESULT

*This shows what the machine on the facing page does to a rotor for an airplane's supercharger. The white lines on its surface are cracks in a brittle varnish with which the wheel was coated. As the wheel spun, centrifugal force caused it to expand. The cracks are at right angles to the stresses produced and are more numerous where the stresses are greatest.*

driven by compressed air, is all that is needed.

Tests below the breaking speed are made by coating the wheel with a brittle varnish. As the wheel speeds up, centrifugal force causes it to expand. The varnish cracks in a direction at right

angles to that of the stress, and the greater the stress the more numerous the cracks. By examining the pattern of these cracks, the direction and magnitude of the stress at every point can be determined.

*Science News Letter, November 29, 1941*

## PSYCHIATRY

## Strict Pre-Induction Tests Avoid Mental Breakdowns

### Psychiatrist Credits Greater Importance of Individual In This War For Low Incidence of Neuroticism Today

**S**TRICT physical and mental examination before induction will enable the United States to avoid mental and nervous breakdowns among its armed forces, Dr. Robert Dick Gillespie, psychiatric specialist of Britain's Royal Air Force, told the New York Academy of Medicine in the Salmon Lectures.

There are remarkably few cases of psychoneuroses among members of the Royal Air Force because of the extreme care used in selection, Dr. Gillespie said.

Only the mentally and emotionally stable get past the weeding out process.

Everyone who flies for the RAF and most of the ground force has the "professional attitude" toward his work, whether he is a pilot or an air gunner, a mechanic or a rigger, he explained. His patriotic devotion is reinforced by his pride in his particular technique and his devotion to his job.

Dr. Gillespie credited the "greater importance which is attached to the indi-

vidual" in this war as one reason why there are fewer neurotics than in the last war. Even among the infantry today a man tends "to be more and more a technician, and less of a foot flogger."

Dr. Gillespie told of a hospital specially built for the care of psychoneurotic victims in the RAF that had to be closed after a few months and directed to other work because there were not enough patients to fill it.

Surprisingly enough, Dr. Gillespie continued, the war has given birth to two institutions, shelter life and community centers, which are highly successful as preventives of psychoneuroses.

"We have learned that shelter life with its common sharing of danger has helped people to withstand peril better than isolation in small groups, which often contributes to the development of psychoneuroses," he said. "The feeling of being with others during an air raid, even in an insecure shelter, brings courage."

Shelter life and community centers fill a need for companionship, Dr. Gillespie went on. In large cities, before the war, we had the paradox of want amid plenty, social want in the midst of social possibilities. Now persons return from safe areas to the shelters in large cities declaring, "I'd rather be bombed than bored."

Dr. Gillespie warned against apathy both among soldiers and civilians as "one of the most significant symptoms of psychoneuroses." This apathy, he said, is usually the result of the continual thwarting of simple desires—in the case of the soldier, the repeated thwarting of the instinct of self-preservation. In the case of the civilian, it is the thwarting of the desire for activity.

"Activity of some sort is a necessary condition of happiness," he said, "and for many people a necessary preventive of psychoneurotic or anti-social behavior. It is important for psychiatrists to recognize the apathy of restlessness which may precede psychoneurosis."

*Science News Letter, November 29, 1941*

## ● RADIO

*Saturday, December 6, 11:45 a.m. EST*

On "Adventures in Science," with Watson Davis, director of Science Service, over Columbia Broadcasting System.

Sidney D. Kirkpatrick, editor of Chemical and Metallurgical Engineering, will discuss magnesium from seawater.

Listen in each later Saturday at 1:30 p.m.

*Monday, December 8, 9:30 p.m., EST*

Science Clubs of America programs over WRUL, Boston, on 6.04 and 11.73 megacycles.

One in a series of regular periods over this short wave station to serve science clubs, particularly in high schools, throughout the Americas. Have your science group listen in at this time.

## INVENTION

**Non-Terrifying Gas Mask Lets Wearer Look Natural**

**A** NEW non-terrifying gas mask, which enables the wearer to look natural through a transparent frontpiece, has been evolved. It is now being tested by the U. S. Army.

While the mask is expected to appeal to feminine America on the grounds that, if women do wear gas masks here, this type removes the beauty hazard—so that the wearer no longer resembles the bride of Frankenstein—the primary importance ascribed to the new mask is its effectiveness, against war gases. Inventor of the new mask is Charles Leguillon, manager of the machine and process development division of the B. F. Goodrich Company.

The new material in the mask, which is a transparent thermoplastic, is said to be considerably more "resistant to all types of poisonous and noxious gases and dust, and does not react to climatic conditions." A defroster, to remove condensed moisture that fogs up eye-pieces in some masks, is provided. Head straps, nose pieces and other parts have been fitted with attention to appearance, and black tubes characteristic of many such masks have been eliminated.

*Science News Letter, November 29, 1941*

## GENERAL SCIENCE

**Canadian Scientists Seek Colleague's Reinstatement**

**S**CIENTISTS at the University of Toronto are making determined efforts to obtain the reinstatement of one of their number, Dr. Samuel Levine, research associate in geophysics, whom they hold to have been unjustly imprisoned, and afterwards deprived of his position at the university, equally without justification. The case is outlined in *Science* (Nov. 14) by Dr. Harry Grundfest of the Rockefeller Institute for Medical Research, national secretary of the American Association of Scientific Workers.

Dr. Levine was arrested after two men, who had been roomers in his house, had been taken into custody as Communists. A few pamphlets were found in his dining room, which the two men had been using. Despite strong testimony in his favor by his colleagues, and the declaration of the two roomers that he had been in no way involved in their affairs, Dr. Levine, tried before a police magistrate and without a jury, was sentenced to six months in prison. After

serving three months, he was released from prison, but confined in an internment camp for nearly another three months before he was given a hearing. After three hearings, with intervals of a month between them, he was unconditionally released.

Dr. Grundfest characterizes the Canadian legislation under which Dr. Levine was arrested and imprisoned as "adopted in war hysteria, harsh and undemocratic," and calls attention to the fact that in Britain, despite the far greater war danger, freedom of speech and of action is far less interfered with than in Canada. He also declares that Dr. Levine's scientific work is of considerable importance as a contribution to defense, and hence merits continuation on its former basis at the University of Toronto.

*Science News Letter, November 29, 1941*

## ANTHROPOLOGY

**Virginia Indians in Pit Graves Unearthed**

**H**URRYING north on leave from First Army maneuvers, Sergeant Howard MacCord reported to scientists his discovery of Indian skeletons in burial pits, in a region of Virginia little known archaeologically.

Addressing the Eastern States Archaeological Federation, meeting in Philadelphia, Sgt. MacCord told how he and Carl Manson, both now National Guardsmen in service, carefully excavated prehistoric bones and pottery at the "Keyser Farm Site" on the Shenandoah River in the western Valley of Virginia last summer.

Smithsonian Institution anthropologists, to whom the young archaeologists turned over the skeletons for examination, have pronounced the identity of these Indians not certain. The skulls are more round-headed than the usual type of Algonkian Indian of Virginia. Pottery from the site has been examined by specialists at the University of Michigan, Sgt. MacCord reported. It shows a resemblance to work of Fort Ancient Mound Builders of Ohio.

Pronounced a strategic location for learning more about Virginia's Indian past, the new Indian site is in a region of many migration trails. No traces of Indian village ruins have yet come to light. Whether the new-found Indians were prehistoric tourists from farther west, or acquired their mid-western type pottery by trade or travel, remains to be cleared up, perhaps by further explorations.

*Science News Letter, November 29, 1941*

## IN SCIENCE

## METALLURGY

**New Way To Harden Steel Like Damascus Process**

**A** NEW method of hardening the surface of steel by the use of synthetic urea was described before the American Society for Metals by Ray P. Dunn, research metallurgist of the Electro Manganese Corporation, Minneapolis, W. B. F. Mackay, flying officer, Royal Canadian Air Force, and Prof. Ralph L. Dowdell, professor of Metallography, University of Minnesota.

The use of synthetic urea as a source of nitrogen in the "nitriding" of steel was investigated because it is cheap, easy to handle, can be obtained in commercially pure crystals and gives off ammonia gas, a compound of nitrogen and hydrogen, when heated to 270 degrees Fahrenheit.

This process brings to mind the famous Damascus blade of Medieval times, which is said to have been surface hardened by the use of camel's dung. If so, these early artificers were unwittingly applying a crude form of the modern process of nitriding steel.

The present investigators tested their process on small specimens of three types of steel, using different furnace temperatures to ascertain the best conditions. Hardness tests on the nitrided specimens showed that high commercial hardness can be obtained with the urea method and the conclusion was drawn that the method has distinct commercial possibilities.

*Science News Letter, November 29, 1941*

## NUTRITION

**New Nickname for Vitamin; "Pantothen," Is Proposed**

**P**ANTOTHENIC ACID, one of the new vitamins which has become so important "it is destined to be almost a household article," has been rechristened by its discoverer, Prof. Roger J. Williams, of the University of Texas. In a report to the scientific journal, *Science* (Nov. 14), Prof. Williams suggests calling the vitamin by the short name of pantothen.

*Science News Letter, November 29, 1941*



# NE FIELDS

## ENGINEERING

### Lights Are Being Tested For Goddess of Liberty

See Front Cover

**T**HE GODDESS of Liberty is to renew her youth and welcome visitors to the United States with a brighter torch and robes of light. A battery of 400-watt mercury vapor lamps will make her torch visible 10 to 20 miles at sea. Flood lamps of the same sort will brighten up her robes with a blue-green glow. One of these lamps is shown on the front cover of this week's SCIENCE NEWS LETTER receiving final inspection by S. G. Hibben, Director of Applied Lighting at the Westinghouse Laboratories in Bloomfield, N. J. The great split sphere behind him measures the intensity of the rays in every direction.

*Science News Letter, November 29, 1941*

## ECONOMICS

### Trade Unions Advised To Champion Farm Labor

**T**RADE unions in the United States must come to the rescue of all labor, including the great low-paid base of the American social pyramid, if the unions are to attain their goal of raising wages and living standards for working people. So runs the advice and the warning of a noted German economist, Prof. Franz Oppenheimer who once taught in the University of Frankfurt and Berlin and is now living in Hollywood, California.

The fundamental weakness of unions is that they are too modest, confining their habitual routine of organizing to urban type labor, Prof. Oppenheimer declares in the first issue (October) of a new technical publication, *The American Journal of Economics and Sociology* (Reviewed, SNL, this issue). American trade unions are given a warning lesson from the "downright annihilation" which has overtaken such industrial organizations in continental Europe.

American industry owes its almost fantastic progress to organizational genius joining hands with scientific theory, Prof. Oppenheimer points out, and he believes that science can similarly aid industrial laborers of America. As

a solution he suggests "internal colonization and wholesale land settlement" to improve the condition of share-croppers, petty tenants and migrant job seekers. Citing "completely successful experiments" of this sort in Europe, the economist states that Nazism wilfully destroyed them.

The new journal, a quarterly review on social and economical problems of the present-day cultural crisis, is published under a grant from the Robert Schalkenbach Foundation.

*Science News Letter, November 29, 1941*

## POPULATION

### Soviet Pre-War Census Proved Timely Defense Aid

**S**INCE BIBLE days, censuses have been valued in gauging a nation's fighting power, and the Soviet Union reports that its 1939, just-pre-war, census is now important aid in the struggle against Nazi invasion.

Whereas old-time head counts were relied on mainly to show how many men could be mustered, now in total war the number and location of such resources as thousands of miners, seamstresses, and truck drivers, become facts of vital usefulness.

The Soviet Union gained 16% in numbers in the 12 years between censuses, the 1939 figures point out. There are 6,000,000 fewer farmers, but machines are doing more of that work. A Soviet trek to the cities in general doubled city population. Industrialization has drawn so many people to cities and centers where natural resources are developed that nearly half of the Soviet Union's people are reported to be factory workers or to belong to families supported in this manner.

The pre-war census gave the Soviet Union a total population of 170,467,000, a figure which had risen to 193,000,000 at start of the present Nazi invasion, due to Baltic and Finnish additions, and which is now in a continual state of wartime flux.

When the census was taken, Soviet Union officials counted on 305,000 architects, engineers, and industrial designers, or almost 10 times as many as in 1926. Farm crop experts numbered 90,000. Metal workers counted by enumerators numbered 4,331,000, or more than four times as many as 12 years before. Instrument and die makers had increased from 11,300 to 137,600.

Brand new to a Russian census were 15,000 armature winders and 8,800 excavator operators.

*Science News Letter, November 29, 1941*

## PHYSICS

### Constant Standard Volt Obtained by "Heavy" Water

**B**Y USE of "heavy" water, that is, water in which the two atoms of hydrogen that are combined with one of oxygen are twice as heavy as in ordinary water, scientists at the Bureau of Standards have succeeded in producing a more constant standard volt. The final tests of the new standard were made by Dr. G. W. Vinal, chief of the electrochemical section, assisted by Mrs. L. H. Brickwedde.

The standard volt is obtained from a standard battery cell which is made with extreme care according to very precise specifications. All other voltages are measured in terms of the voltage given by this cell. Just as the standard of length, preserved by the Bureau of Standards, must always give the same length, this cell must always give the same voltage.

The Bureau has several such "standard cells" and, although very satisfactory, they require a certain period of aging before they settle down to a truly constant voltage and can be used. After seven years of research in the effort to improve the standard cell, the Bureau scientists found that by using a large percentage of "heavy" water in the liquid of the cell, its performance was improved and the aging period reduced.

*Science News Letter, November 29, 1941*

## PALEONTOLOGY

### Colorado Mesa Contains Fossil-Bearing Layers

**A** "LOST horizon" constituting the boundary between the Age of Dinosaurs and the Age of Mammals has been found in the Colorado mountains near Denver, by paleontologists of the U. S. Geological Survey and the Smithsonian Institution. The sequence from extinct reptiles to ancient mammals has been studied by Dr. R. W. Brown and Dr. C. Lewis Gazin of the U. S. National Museum.

The site is a mesa topped with a layer of basalt. About 200 feet down from this protecting cap of hard rock is a layer containing fossils of paleocene mammals, primitive flesh-eating creatures that roamed the earth about 50 million years ago. Below this is a layer of about 50 feet of barren rock, containing no fossils, and immediately below that is the stratum containing the dinosaur bones.

*Science News Letter, November 29, 1941*

ASTRONOMY

# Four Christmas Stars

## Brilliant Planet in the East Is Attended By Others In the South and West; Venus at Maximum Brightness

By JAMES STOKLEY

**A**S CHRISTMAS approaches this year we have not only a brilliant "star" in the east, but one in the south and another in the west as well. These are the planets, actually four in number, which have added their splendor to the constellations of late autumn to make the skies even more glorious than usual.

In December, as last month, we again have the unusual privilege of seeing four planets in the sky at once. While Mars has dimmed a little, two others, Venus and Jupiter, are now at their greatest brilliance, while the fourth, Saturn, is also brighter than average.

Venus is most brilliant of all and this month it reaches its maximum on the 28th, with magnitude minus 4.4 on the astronomical scale. It is not indicated on these maps, since it sets about three hours after the sun, while they are drawn for 10:00 p.m., Dec. 1 and 9:00 p.m., Dec. 15. However, it is very easy to find, because it is so bright. Long before dark it can be seen in the southwest, shining so brilliantly that it is hard to believe it is a heavenly body. Often in the past, when Venus was as bright as this, it was called the Edison star, because many thought that it was some kind of brilliant electric lamp that Edison hung on a balloon. Perhaps the 1941 version will make it some secret anti-aircraft device worked out in connection with America's defense program!

### Shown on Maps

The maps shows the position of the other three planets. Jupiter is the second in brightness with magnitude minus 2.4. It is in the constellation of Taurus the bull, north of ruddy Aldebaran. Saturn is also in Taurus, just south of the little cluster of stars known as the Pleiades. It is of the zero magnitude. Faintest of the planets now in the sky, it is brighter than any star except Sirius, in Canis Major, the great dog, to the south-east.

Mars is to the southwest, in the constellation of Pisces, the fishes. Its magnitude is minus 0.5, so it also is inferior to Sirius which is minus 1.6.

Among the stars, which shine with their own light and are not, as the planets, illuminated by the sun, there are several of the first magnitude that we can see. Aldebaran, near Mars is one; so is Procyon, in Canis Minor, to the east. Above Sirius is Orion, the warrior, in which a row of three stars form the figure's belt. North of the belt is Betelgeuse, south is Rigel. High in the northeast is Capella, in Auriga, the charioteer, and below him are the twins, Gemini. One of these stars, Pollux, is also first magnitude. The two remaining stars of this class now seen are Deneb, in Cygnus, the swan, to the northwest, and Vega, below it near the horizon, about all that now remains of Lyra, the lyre.

### Sirius Quite Close

The brilliance which the stars in the sky appear to have is due partly to their actual brightness, their "candlepower," and partly to their distance. Sirius is the brightest star we see in the night sky. Though it is 26 times the intrinsic brightness of the nearest of all stars, the sun, this is still not very bright as stars go. Sirius looks so bright because it is quite close, only 48,000,000,000,000 miles, or 8 light years as the astronomers say. That means that its light (traveling about 11,000,000 miles a minute) takes 8 years to reach us. Rigel, however, is 18,000 times as bright as the sun, yet it looks fainter than Sirius, because it is 543 light years away.

The brightness of a planet depends on slightly different factors. One, as with

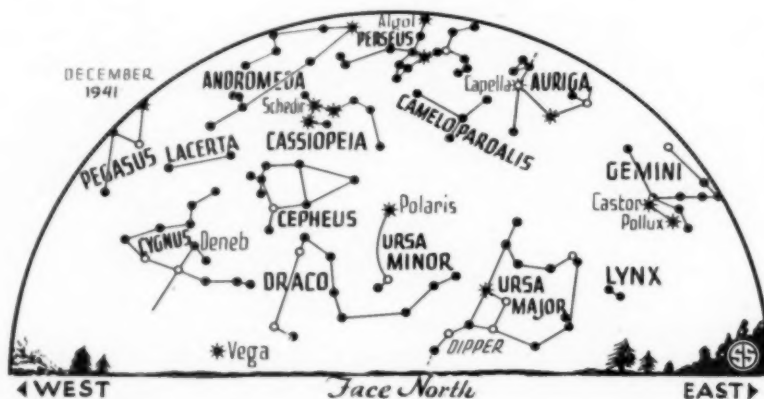
the stars, is distance. Naturally, the nearer a planet is to the earth, the brighter it looks. That is why Mars has been so brilliant during recent months. It was making a close approach which brought it, on Oct. 10, within 38,510,000 miles of earth, nearer than for the next 17 years. Now as it is drawing away, it is rapidly dimming, at the approximate rate of one magnitude per month.

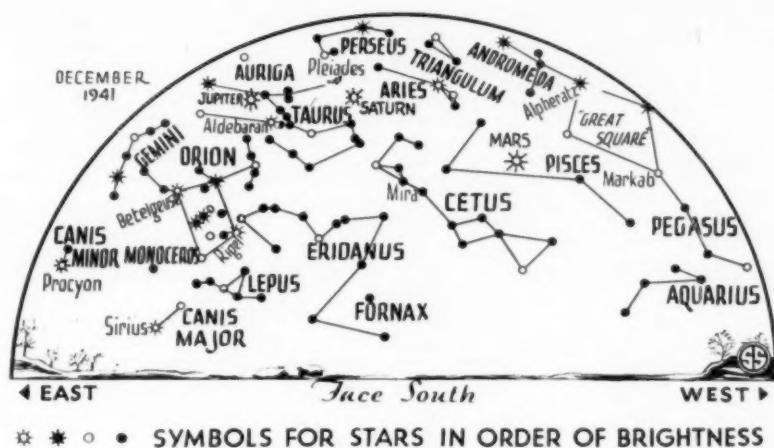
### Jupiter Opposite Sun

Jupiter, too, is now very bright because it is close. On Dec. 8 it is in opposition to the sun. This means that, seen from earth, planet and sun are in opposite directions. In other words, the earth is then in the same direction from the sun as Jupiter. Distance from the earth to the planet is least, now about 380,000,000 miles.

Saturn was in opposition last month, so it, too, is fairly close. However, its brightness also comes from the fact that just now its rings are spread out at their fullest angle as viewed from here. In a few years when these thin rings, really a swarm of myriads of tiny moons, are seen on edge, very little of the light they reflect will come to the earth.

The changing brightness of Venus is more complicated. This planet, like Mercury which cannot now be seen, is nearer the sun than we are. As it swings between the sun and earth, most of the bright half is turned away, and the planet is in a phase like that of a crescent moon. This is the way you can see it now if you look at it through a telescope. If, like the moon, Venus remained at about the same distance as it changed in phase, it would be brightest when full, when the sunlit half was turned en-





tirely to the earth. But when Venus is full, it is far beyond the sun and its distance makes it faint. In recent months, it has been getting closer, and brighter, to reach a maximum on December 28.

After that date it will get still nearer, and bigger, but the crescent will become so narrow that it will begin to get fainter once more.

*Science News Letter, November 29, 1941*

METEOROLOGY—GENERAL SCIENCE

## Weather Scientists Doing Important Defense Work

### Meteorologists Among Instructors in C.A.A. Courses At 1,000 Colleges; Few Who Do Not Give Part Time

**M**ETEOROLOGISTS watch the skies nowadays with first thought for national defense. They have postponed "for duration" many research projects dear to their hearts, and are devoting themselves to the training of field observers for the Army and Navy, and to the instruction of aviators in such parts of their science as will enable them to fly better. These and other contributions of weather scientists were pointed out by Prof. Charles F. Brooks, head of Harvard University's Blue Hill Meteorological Observatory, at a symposium on Scientists and the Emergency held by the American Association of Scientific Workers in Cambridge.

"I should estimate that perhaps a quarter to a half of the time of meteorologists in the United States is now being devoted to defense activities," Prof. Brooks stated. "There are those in the armed forces and civilian instructors in the numerous schools for airplane pilots and navigators who are devoting all their time to the defense effort.

"There are those in the universities and technical schools who are devot-

ing practically all their time to training hundreds of cadet officers to become weather forecasters.

"There are probably 50 or 100 meteorologists among the instructors in the C.A.A. courses at 1,000 institutions of higher learning throughout the country.

"The U. S. Weather Bureau is working on many projects at the behest of the Army or Navy, and its general forecasting service is used directly or indirectly by the people of the United States, including defense workers, while special forecasting in connection with particular defense needs is much in demand.

"There are, indeed, few meteorologists whose time is not being devoted in part to defense."

Deflection of research effort to problems of immediate defense significance is felt most acutely in the fields of pure research. Prof. Brooks pointed out that it is exactly this kind of research that in the end pays the biggest, though often the least foreseen, dividends.

This handicap is partly offset, however, by the intensification of research in certain other applied lines, and in

the increase in facilities which are being made available because the defense program calls for their use. Results thus obtained will not be confined to defense, nor will the benefits gained be discontinued with the cessation of the national emergency, the speaker concluded.

*Science News Letter, November 29, 1941*

## Contacts in Mexico Urged

**M**EXICANS, far better disposed toward the United States than they ever were before the advent of the "Good Neighbor" policy, still await more effective implementation of that policy, so far as culture is concerned, and especially so far as science is concerned, declared Prof. Bart J. Bok of Harvard College Observatory, who reported on his visit in Mexico last summer.

If Americans with business or professional contacts in Mexico would only learn to speak Spanish, it would help enormously, Prof. Bok contended.

"Judging from what I heard throughout Mexico," he said, "the success of Vice President Wallace's visit to Mexico City was in no small measure due to his knowledge of Spanish and the delivery of his major address in that language."

Mexicans are keenly interested in science, especially since the spread of literacy through the government's educational program, Prof. Bok observed. He recommended that American educational foundations extend their activities in our neighbor republic, that the present excellent practice of granting scholarships in American universities to students from Mexico be followed through by giving them further aid after their return home, and that Americans do all they can to encourage adult education and science popularization in Mexico.

"The Mexican public wishes to know of modern science," he declared. "One feels that it would be a great thing if Latin America could receive a Spanish edition of our American SCIENCE NEWS LETTER, the news releases from Science Service and translations of our best popular scientific books."

*Science News Letter, November 29, 1941*

Colors of the French *tricolor* flag, which appear equally wide, are really in proportion of red — 3, white, — 3.3; blue—3.7; says the Better Vision Institute, explaining that the lens of the eye does not bend light rays of different colors in precisely the same degree, and early flags made of equal colors looked unequal.



## PSYCHIATRY

# "Crisis Psychology" Danger Stressed by Psychiatrist

## Psychiatrists Urged To Use Their Knowledge of Human Mind to Develop Defense Against War of Nerves

**W**ARNING against the dangers of developing a domestic brand of the German "crisis psychology" was sounded by Dr. Bernard Glueck, Ossining, New York, psychiatrist, speaking before the National Committee for Mental Hygiene.

Overworking of such words as "crisis," "emergency," "danger," "blitzkrieg," "total war," may contribute toward the creation of the state of mind that Germany has used so effectively as a weapon against enemies and also to drive the German people, he said.

"We must avoid," Dr. Glueck said, "the kind of mishandling of our own psychology which would encourage a fear of being afraid."

Psychiatrists should use their knowledge of the human mind to develop counter-offensives against Hitler's war of nerves, he indicated.

"We know something of the techniques of influencing attitudes and feelings in the individual," he said. "We must apply ourselves to the task of discovering methods for the application of the consultation-room techniques to ever larger groups of people. We know something of the subjective conditions in the nature of man which favor the development of anxiety, guilt, and fear of divided, sometimes antithetical, loyalties that are so crippling to behavior. We know something of the nascent Hitlerisms and Quislingisms within our own natures."

But psychiatrists need not confine themselves to the treatment of psychological casualties.

"We must find," he said, "the means of making our people aware of the strengths within them."

*Science News Letter, November 29, 1941*

## Won't Fit Jobs Held Open

**Y**OU CAN hold his job for the man who goes into the Army, but you can't put him back into it when he comes home, Dr. George H. Preston, Commissioner of Mental Hygiene of Maryland, told the National Committee for Mental Hygiene.

The returning soldier won't fit the old job, because he has changed, Dr. Preston said.

"In the normal course of events," he explained, "a man moves from position to position, assuming responsibility, acquiring seniority, and frequently increasing his income from year to year. In civil life, the job grows with the man and the man's standard of living grows with the job."

But the old saying, "The Army will make a man of him," is significant, because the Army does just that. When a man comes out of the Army, he can't go back to a job as messenger or junior clerk or apprentice; he can't go back to a college class. He is a man, not a boy.

But the maturity given by Army life is a one-sided sort of development, Dr. Preston pointed out, because in the Army an individual has no chance to develop complete adult responsibility. He learns to live by regulations, not by his own planning. He knows how to be responsible for carrying out his own duties, but he has been able to spend his entire week's pay on Saturday night and still eat next week.

The readjustment of the returning soldier is more difficult for white-collar workers and those in skilled occupations than for unskilled workers or farm laborers, Dr. Preston said.

It is much easier, he said, for men who already were mature when they went into the Army.

*Science News Letter, November 29, 1941*

## ASTRONOMY

## Film Shows Sun Tornado Big Enough to Cover U. S.

**M**OTION pictures of fiery gas in the atmosphere of the sun large enough to cover the entire United States and whirling at a speed of 120,000 miles per hour are described by Dr. Edison Pettit of the Mount Wilson Observatory in a report to the Astronomical Society of the Pacific. The photographs were taken with a new type of instrument,

an interference polarizing monochromator, that has not been previously used in this work.

When first seen the solar tornado was 8000 miles wide at its base and 38,000 miles high. A smoke-like column projecting from its top reached an elevation of 68,000 miles after which it bent over and returned to the sun's surface. During the course of the observations a knot of gas broke away from the top and was ejected upward with a speed of 130,000 miles per hour. About two hours later the whole vortex started to rise, losing its spiral structure but remaining attached to the sun by two fine streamers. It finally faded from sight completely.

Dr. Pettit stressed the advantages of motion pictures over single photographs in the study of fiery clouds in the solar atmosphere.

"Solar tornados have been seen to rotate faster and faster until they blew up like desert dust storms," he said, "and moving pictures of such objects in action, should help us to determine the exact speed at which disintegration occurs."

*Science News Letter, November 29, 1941*

## METEOROLOGY

## Not One Stratosphere, But Two, Says Scientist

**N**OT just one stratosphere, but two, hover high in air above earth's middle latitudes, declares Dr. Henryk Arctowski, noted Polish meteorologist now working at the Smithsonian Institution. Dr. Arctowski was brought to his conclusion by a study of radiosonde data from very high altitudes obtained by the little "robot weathermen" who sail aloft on balloons sent up by the U. S. Weather Bureau.

The stratosphere begins at the level where the atmosphere no longer gets any colder with continued ascent. This level is known as the tropopause. Above the equator, the tropopause is about 12 miles up, and it slopes downward from this level toward the poles. The earth therefore has an atmospheric roof.

However, the data studied by Dr. Arctowski showed that above the tropopause in the temperate zones, the temperature remained steady for some distance up, then started declining again, reaching a second steady point at a still higher level. Above the middle latitudes, therefore, there is a second tropopause, marking the boundary of a "pseudostatosphere"—an attic beneath the roof of the world.

*Science News Letter, November 29, 1941*

## New Machines And Gadgets

### Novel Things for Better Living

The Nazi Blitz over the rough Russian roads may at this very moment be having its way somewhat smoothed by a motorcycle shock absorber invented by a German, patented in this country and assigned to a Munich automotive company. The wheel forks consist of concentric tubes which telescope into each other, but are held in normal position by a spring. A third inner tube is filled with a shock-absorbing fluid. A piston plunges into this fluid, when a jounce is encountered, pushing it out through small openings in the top into the space between the tubes, whence it returns to the bottom of the original tube, thus resisting the telescoping motion of the two outer tubes one on the other.

Removing the bark from a log while it is still floating in the river, may seem an impossible task. But it is neatly accomplished by a machine recently patented by an Oregon lumber man. The machine is mounted on a float, a chain is wound around the log spiral fashion, the machine pulls the log alongside the float and by continuing to pull on one end of the chain while slackening off on the other, causes the log to roll and move lengthwise against a cutter that shears off the bark.

Pack up your house and take it with you. Yes, you can really do it with a recently patented folding house. It folds into a flat rectangular box, just the right width to take on a trailer, but still wide and high enough to contain the furniture and much of your luggage. The floor folds in three sections, like the typewritten letters you get in a long envelope, so that when unfolded it is wider than the trailer.

Cat's whiskers for automobiles are provided by a recently patented invention. If the motorist wishes to squeeze through a narrow opening between two other cars or the entrance to his garage, he can shoot out four feelers, slender rods, one at each corner of his car. If something touches any of these feelers, the fact is at once indicated on the dashboard. When he doesn't need them, the motorist, like the cat, can pull in his feelers.

Amateur photographers who wish to make their own color prints will find the apparatus illustrated a very great help. In making such prints, three negatives have to be made, one corresponding to each of the three primary colors. If these negatives are not each of just the right density, the resulting color



print is a mess. The whole work may have to be done over several times before the right combination is struck. By putting the three "separation negatives" in the machine and turning on the red, blue and yellow lights, you can see at once exactly what the final print would look like. If the color balance is not good, dials can be turned which increase or diminish the various colors until the result exactly suits your taste. From the dial readings, the final print can be made. The three negatives can also be exactly registered in the machine before you begin to print.

Measuring out a level spoonful, ordinarily an inconvenient task for exact cooks or home chemists, is made more convenient by a double-ended spoon (two sizes in one implement), recently patented, that has a levelling blade pivoted at the middle of the handle. The blade can be swung all the way around and level off either spoonful.

If you want more information on the new things described here, send a three-cent stamp to SCIENCE NEWS LETTER, 1719 N St., N. W., Washington, D. C., and ask for Gadget Bulletin 81.

Science News Letter, November 29, 1941

#### PUBLIC HEALTH

### Eye Injuries In U. S. Total 1,000 a Day

EYE injuries in American industries are occurring at the rate of 1,000 every working day, and 98% of these hurts are wholly unnecessary, it is revealed in a study sponsored by the National Society for the Prevention of Blindness just published. (Columbia University Press).

Conserving eyesight of workmen is as vital to defense as building armament and training soldiers, declares Lewis H. Carris, director emeritus of the Society,

in a preface to the comprehensive study.

Eye injuries to workers, which total about 300,000 a year in factories, mills, mines and shops, cost the injured workmen and their communities \$100,000,000 a year and employers another \$100,000,000, says the report by the late Louis Resnick of the Society staff. Mr. Resnick's report was completed three days before his death last March. About 1,000 workers lose sight of one eye and 100 or more lose sight of both eyes in a year, the result of occupational hazards, he found. Many more have damaged sight.

"There is no need for the blinding of workers in American industry," Mr. Resnick concluded. "The industrial accident and disease hazards affecting the eyes are now commonly known. Methods of eliminating these hazards or of protecting workers against them have been thoroughly demonstrated. Devices which provide protection against almost every type of eye accident are now available."

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#### MEDICINE

### Fat Men Found Prone To Knee Injuries

FAT MEN with weak muscles are most likely to injure their kneecaps, according to a study of 1,700 such injuries reported by Drs. Edward K. Cravener and Donald G. MacElroy of Schenectady, N. Y. (Journal, American Medical Association, Nov. 15).

Eighty-six per cent of the injuries occurred in men and boys and 14% in women and girls. Over 60% of the patients were overweight. Injuries to the knee cartilage were found to occur most commonly at about the twenty-ninth year of life.

Science News Letter, November 29, 1941

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## PUBLIC HEALTH

# Deaths From Tuberculosis Decreasing Among Workers

## Dropping More Rapidly Among Industrial Groups Than Among the Rest of the Population, Studies Show

**D**EATHS from tuberculosis have decreased more swiftly among industrial groups than among the general population, Dr. L. U. Gardner, director, The Saranac Laboratory, reported to the Sixth Annual Meeting of the Industrial Hygiene Foundation of America in Pittsburgh.

Dr. Gardner's statement was based on careful studies by 30 observers in different industrial environments. It was made to refute "a growing tendency to account for a freshly discovered case of tuberculosis as a product of industrial environment."

"A low standard of living, rather than specific environmental factors, is responsible for most of the tuberculosis among wage earners," Dr. Gardner said. "For example, the influence of nutrition, fatigue, extremes of temperature and humidity and specific intoxications such as lead, were discussed and it was agreed that only nutrition had an appreciable effect upon tuberculosis incidence among workers."

Dr. Gardner found that of the respiratory irritants, including fumes and gases, as well as dusts, only free silica has a specific influence upon the disease.

To illustrate the negative tubercular effects of a pulmonary irritant, Dr. Gardner cited an experiment in which guinea pigs with super-imposed tuberculosis were exposed to arc welding fumes.

A control group of tuberculous animals was not exposed. It was discovered that in spite of severe inflammatory reaction in the lungs due to the welding fumes, the exposed animals recovered from tuberculosis equally as well as the non-exposed controls.

Another group of guinea pigs—200 were used in all—infected with the same type of tuberculosis, and at subsequent intervals of four, six and eight months, exposed to the fumes. The preformed healing tubercles in the lungs were not reactivated by the fumes as was the case when the animals were exposed to quartz dust.

*Science News Letter, November 29, 1941*

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## SCIENCE CLUBS OF AMERICA

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### NEWS OF CLUBS

**PHILADELPHIA, Pa.**—The many and varied interests of Boy Scouts permit the formation of units having diversified interests. Take, for example, the Fact-finders, a club formed in Troup 293 Boy Scouts of America, and sponsored by Ben Maser, Director of Crafts, Hobbies and Educational Projections. This group is interested in photography, miniature model making, chemical and electrical experiments, nature study and collections, mineralogy, miniature gardens, aquariums and astronomy. It presents programs to the Parent Association and hears lectures by visiting scientists.

**KALAMAZOO, Mich.**—Last year Russell McDougal sponsored a club at the Roosevelt School. The club is still in existence. This year, however, this teacher of science founded a new club at the Vine School under the name of the Vine Science Club. And that's the way it goes—an active sponsor will stimulate a successful club everywhere he goes.

**ROARING SPRING, Pa.**—The Rising Scientists of Roaring Spring is the colorful name chosen by the club at Roaring Spring Junior-Senior High School. The activities of this club are general in nature, with field trips in the fall and spring, and visits to scientific places in the winter. The sponsor is J. R. Sprowls, Instructor in the Department of Science.

**CAMP HILL, Pa.**—School service projects occupy much of the time of members of the Lawrence Science Club at Camp Hill High School. Members of this group repair electrical systems, motors, and construct scientific equipment. The club visits the Franklin Institute and Smithsonian Institution regularly. Cave explorations are conducted by members whose club activities are sponsored by D. L. Knorr, Head of the Science Department. This club is also affiliated with the Pennsylvania Junior Academy of Science.

**ALDAN, Pa.**—The Active Atoms of Aldan (AAA) is the name of a science club formed at the Aldan Junior High School. Under sponsorship of Charles P. Forbes, Head of the Science Department, the club gives science assembly programs, is in attendance at a science congress, takes charge of all ushering, and maintains a 40-gallon aquarium in the pink of condition. The group also is affiliated with the Science Forum and the Suburban Science Clubs of Philadelphia.

**ITHACA, N. Y.**—This year, for the first time, the Department of Astronomy at Cornell University is sponsoring a group of amateurs interested in telescope making and in the grinding of optical parts essential to the construction of telescopes and binoculars. This group, called the Amateur Opticians Guild, is under guidance of Assistant Professor William Shaw and Professor S. L. Boothroyd. Already several 4- and 12-inch reflecting instruments are under construction. It is hoped that the proficiency of some of the members will develop to such a point that they may be able to accept government contracts for the construction of prisms used in army binoculars. The Guild extends invitation to outsiders with definite interest in such work to join the group.

**TULSA, Okla.**—The Field and Stream Club of the Woodrow Wilson Junior High School is actively interested in natural sciences with an occasional mixture of the physical sciences. Every year the club makes a Christmas bird census; participates in a school flower show; and prepares exhibits and papers for the Northeast District Junior Academy of Science and the Oklahoma State Junior Academy of Science. This club, sponsored by Edith R. Force, Science Teacher, also is affiliated with the National Audubon Societies and the American Forestry Association.

**SAPULPA, Okla.**—Members of the Sapulpa Junior Science Club at Washington School are making what they believe will become the finest collection of insects and seeds of wildflowers and weeds in that part of the country. The club is sponsored by Zella Breitenbecher, Teacher.

Clubs are invited to become affiliated with SCA for a nominal \$2 for 20 members or less. You can become an associate of SCA for 25 cents, which includes a copy of the 128-page Science Handbook for 1942. Address: Science Clubs of America, 1719 N St., N.W., Washington, D. C.



# •First Glances at New Books

Additional Reviews  
On Page 352

## ORNITHOLOGY

THE BIRDS OF AMERICA—John James Audubon — *Macmillan*, colored illus., \$4.95. When the first printing of this volume appeared, four years ago, it was a matter for congratulation that it sold for only \$12.50. Now, a reduction to less than half that price puts this splendid set of reproductions of the "elephant folio" plates within the reach of additional thousands of bird lovers and book lovers. For a person in either of those two large groups, a better Christmas gift can hardly be imagined.

*Science News Letter, November 29, 1941*

## BIOLOGY

MANUAL OF BIOLOGY (6th ed.)—George Alfred Baitsell—*Macmillan*, 448 p., \$2.75. New edition of a successful textbook.

*Science News Letter, November 29, 1941*

## CHEMISTRY

QUALITATIVE ANALYSIS (3d ed.)—H. V. Anderson and T. H. Hazlehurst—*Prentice-Hall*, 266 p., \$3.70 trade; \$2.75 school. In this edition, more attention is paid to acid-base reactions and to oxidation-reduction reactions. Semi-micro techniques are treated along with macro techniques. New exercises have been added and the tables brought to date.

*Science News Letter, November 29, 1941*

## CHEMISTRY

PRINCIPLES OF GENERAL CHEMISTRY (3d ed.)—Stuart R. Brinkley—*Macmillan*, 703 p., illus., \$4. This edition, like the preceding editions is intended as a second college course for students who have had some preparation. A chapter has been added dealing with the nucleus of the atom, artificial radioactivity, transmutation and nuclear fission.

*Science News Letter, November 29, 1941*

## ECONOMICS

THE DEVELOPMENT OF AMERICAN INDUSTRIES, Their Economic Significance (rev. ed.)—John George Glover and William Bouck Cornell, eds.—*Prentice-Hall*, 1005 p., \$5.50 trade; \$4.50 school. How things are made and were made in 39 major industries in this country, is told in this book. In this revised edition, statistics are brought up to date, changes in methods of production are discussed and new products are described.

*Science News Letter, November 29, 1941*

## CHEMISTRY

TEXTBOOK OF QUANTITATIVE ANALYSIS (3d ed.)—William Thomas Hall—*Wiley*, 364 p., illus., \$3. This new edition

of a standard text incorporates changes suggested by the author's ten years experience with it in the class-room. New material has been added on steel analysis, the glass electrode, acidimetry and gravimetric analysis.

*Science News Letter, November 29, 1941*

## TECHNOLOGY

RUBBER RED BOOK, Directory of the Rubber Industry, 1941—*Rubber Age*, 511 p. \$5.

*Science News Letter, November 29, 1941*

## CHEMISTRY

A BRIEF COURSE IN ORGANIC CHEMISTRY, A Combined Textbook and Laboratory Manual—Reynold C. Fuson, Ralph Connor, Charles C. Price and H. R. Snyder—*Wiley*, 248 p., \$2.50. This text aims to acquaint students of agriculture, home economics and medicine as quickly as possible with the chemistry of those materials that will later concern them in their professions.

*Science News Letter, November 29, 1941*

## ETHNOLOGY

PEACHTREE MOUND AND VILLAGE SITE, CHEROKEE COUNTY, NORTH CAROLINA—Frank M. Setzler, Jesse D. Jennings and T. D. Stewart—*Govt. Print. Off.*, 103 p., illus., 40c. Describes excavations at a site which may well be the Indian town Guasili visited by De Soto. The inhabitants from prehistoric times on had a blended Woodland and Mississippi culture and were probably all Cherokee.

*Science News Letter, November 29, 1941*

## MECHANICAL ENGINEERING

TOOL DESIGN, Fundamental Principles of Design as Applied to Tooling for Production—Charles Bradford Cole—*American Technical Soc.*, 498 p., \$4.50. This treatise is a companion piece to the more popular book "Tool Making" by the same author. It covers the same ground, but stresses the design rather than the making of tools. The style is simple and direct. The beginner will find useful information and the expert will find suggestions that will help him in many problems.

*Science News Letter, November 29, 1941*

## ENGINEERING

THE ST. LAWRENCE SURVEY, Part III, Potential Traffic on the St. Lawrence Seaway—N. R. Danielian—*Govt. Print. Off.*, 342 p., 40c.

*Science News Letter, November 29, 1941*

## MEDICINE

THE ADVANCING FRONT OF MEDICINE—George W. Gray—*Whittlesey House*, 425 p., \$3.00. Here is an exceptionally well written book which brings the layman up-to-date on the aspects of medicine of most interest to him—sleep, pain, cancer, drink, anxiety, allergy, the sulfa drugs, etc. There is a valuable closing chapter on aging—a field of medicine just beginning to receive special scientific attention.

*Science News Letter, November 29, 1941*

## MECHANICAL ENGINEERING

HOW TO TRAIN SHOP WORKERS—C. A. Prosser in collaboration with Philip S. Van Wyck—*American Technical Soc.*, 126 p., \$1.25. A manual for use by foremen and instructors in training men in shop work, particularly in efficient habits of work and of workmanship. It is written in a simple "how-to-do-it" style and should be useful both to instructors and learners.

*Science News Letter, November 29, 1941*

## PHOTOGRAPHY

THE AMERICAN ANNUAL OF PHOTOGRAPHY, 1942 (Vol. 56)—Frank R. Fraprie and Franklin I. Jordan, eds.—*American Photographic Pub. Co.*, 280 p., illus., \$2.25 cloth; \$1.50 paper. A beautiful volume of photographs and articles about photography, containing also the "Who's Who in Pictorial Photography."

*Science News Letter, November 29, 1941*

## CHEMISTRY

QUANTITATIVE ANALYSIS (Rev. ed.)—Eugene W. Kanning—*Prentice-Hall*, 471 p., Trade, \$3.70; Schools, \$3. While preserving the method of presentation of the first edition, a large part of the text has been rewritten and enlarged in the manner that class use indicated as desirable. A brief description of polarography and of the modern theories of electrolytic dissociation has been added.

*Science News Letter, November 29, 1941*

## CHEMISTRY

FUNDAMENTALS OF CHEMISTRY (5th ed.) L. Jean Bogert—*Saunders*, 528 p., illus., \$3.

LABORATORY MANUAL OF CHEMISTRY (4th ed.)—L. Jean Bogart—*Saunders*, 165 p., 75c. Chemistry from the biological angle is the viewpoint of the new as well as of the old editions of these two books. Only so much of inorganic chemistry is given as is necessary to understand the uses of chemistry in biology, medicine and nursing.

*Science News Letter, November 29, 1941*

# •First Glances at New Books

Additional Reviews  
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## MEDICINE—GENETICS

**MEDICAL GENETICS**—Laurence H. Snyder—*Duke Univ. Press*, 130 p., illus., \$1.50. An excellent little handbook on modern genetic knowledge, not too technical for laymen. It contains much practical advice on marriage under circumstances of inheritable diseases, including cancer-tendency inheritance. The book should help clear up considerable misunderstanding about just what is known and what must be learned about genetics.

*Science News Letter, November 29, 1941*

## MATHEMATICS

**THE PENGUIN PROBLEMS BOOK**—W. T. Williams and G. H. Savage—*Penguin*, 156 p., 25c. A collection of curious mathematical and word problems with solutions in the back of the book.

*Science News Letter, November 29, 1941*

## CHEMISTRY

**THE GLASS ELECTRODE: Methods, Applications, and Theory**—Malcolm Dole—*Wiley*, 332 p., illus., \$4.50. All pertinent material concerning pH (hydrogen ion or acidity) measurements with the glass electrode is presented in this monograph. A brief review of other methods of pH measurement and of the history of the glass electrode, its difficulties and limitations, is included.

*Science News Letter, November 29, 1941*

## PHYSICS

**INTRODUCTION TO PHYSICAL STATISTICS**—Robert Bruce Lindsay—*Wiley*, 306 p., \$3.75. A thorough but not too lengthy introduction to the method of statistical physics for students with a background of theoretical physics. The use of statistical reasoning in physics is surveyed from early classical applications to modern quantum mechanics.

*Science News Letter, November 29, 1941*

## ANTHROPOLOGY

**DISEASES OF AND ARTIFACTS ON SKULLS AND BONES FROM KODIAK ISLAND**—Ales Hrdlicka—*Smithsonian Institution*, 14 p., 11 pl., 20c. (Miscellaneous Collections, Vol. 101, No. 4). See SNL Oct. 25, p. 264

*Science News Letter, November 29, 1941*

## ICHTHYOLOGY

**SYSTEMATIC CATALOGUE OF THE FISHES OF TORTUGAS, FLORIDA, With Observations on Color, Habits, and Local Distribution**—William H. Longley and Samuel F. Hildebrand—*Carnegie Institution of Washington*, 331 p., 34 pl., \$2.50 paper; \$3.50 cloth. Ichthyologists,

and zoologists generally, have been waiting for a long time for the completion of this work, which the late Prof. Longley started a quarter of a century ago. Happily now it has been brought to publication by a colleague, so that it may take its rightful place on the reference shelves of working libraries.

*Science News Letter, November 29, 1941*

## MEDICINE

**MAN, MICROBE AND MALADY**—John Drew—*Penguin*, 218 p., illus., 25c. A clear but accurate account for the general reader of the more common bacteria and what they do to—and for, men. Especially interesting is the final chapter which concludes that use of bacteria as weapons in wartime is virtually impossible.

*Science News Letter, November 29, 1941*

## TECHNOLOGY

**PLASTICS**—V. E. Yarsley and E. G. Couzens—*Penguin*, 16 p., 25c. Despite its diminutive size, this little book contains about everything the layman would like to know about plastics, their history, chemistry, properties, sources, manufacture and uses.

*Science News Letter, November 29, 1941*

## GEOLOGY

**OUTLINES OF GEOLOGY, A Combination of OUTLINES OF PHYSICAL GEOLOGY** by Chester R. Longwell, Adolph Knopf and Richard F. Flint and **OUTLINES OF HISTORICAL GEOLOGY** by Charles Schuchert and Carl O. Dunbar (2d ed.)—*Wiley*, 672 p., \$4. Revised edition of a combination text that has proved its worth in the four years that have elapsed since its first appearance.

*Science News Letter, November 29, 1941*

## PUBLIC HEALTH

**ORIENTATION IN SCHOOL HEALTH**—Clair V. Langton—*Harper*, 680 p., illus., \$3. Designed to give school teachers, principals and superintendents fundamental information on organization and administration of a school health program.

*Science News Letter, November 29, 1941*

## TECHNOLOGY

**GLASS: The Miracle Maker, Its History, Technology and Applications**—C. J. Phillips—*Pitman*, 424 p., illus., \$4.50. Everything about glass, its history, chemistry, physical and chemical properties, manufacture and application, both useful and decorative. Also a chapter on fiber glass.

*Science News Letter, November 29, 1941*

## MILITARY SCIENCE

**BOMBS AND BOMBING**—Willy Ley—*Modern Age Books*, 121 p., illus., \$1.25. This is one of the most useful of the rather numerous books on military topics that have been appearing lately. Although brief, it is well packed with definitely established facts; and (what is perhaps of equal importance) it does a lot of beneficial debunking of pre-war "scare stuff" still rather widely accepted.

*Science News Letter, November 29, 1941*

## ENGINEERING

**FLUID MECHANICS AND STATISTICAL METHODS IN ENGINEERING**—Hugh L. Dryden and others—*Univ. of Pennsylvania Press*, 146 p., illus., \$1.75. The mechanics of fluids as applied to airplanes and projectiles are discussed and illustrated. The contributions of mathematical statistics to science and engineering and to purchasing specifications and their relations to law and legislation are presented.

*Science News Letter, November 29, 1941*

## ASTRONOMY

**MAGNITUDES AND COLORS OF STARS NORTH OF + 80°**—Frederick H. Seares, Frank E. Ross and Mary C. Joyner—*Carnegie Institution of Washington*, 89 p., \$1.50 paper, \$2 cloth.

*Science News Letter, November 29, 1941*

## NUTRITION

**AMERICA'S NUTRITION PRIMER, What to Eat and Why**—Eleanor Sense—*Barrows*, 95 p., \$1. A simple, practical guide, with menus and recipes, to good diet for good health. Restaurant eaters are not overlooked, nor are those who want to add to or reduce their weight.

*Science News Letter, November 29, 1941*

## ARCHAEOLOGY

**LOST WORLDS, Adventures in Archaeology**—Anne Terry White—*Random House*, 316 p., \$2.50. A very attractive introduction to the science of archaeology for young readers. Mrs. White tells the stories of great digging discoveries—the Palace of Minos, Rosetta Stone, Tutankhamen, and many others—and to the telling she adds a good deal of scientific background.

*Science News Letter, November 29, 1941*

## SOCIOLOGY—ECONOMICS

**THE AMERICAN JOURNAL OF ECONOMICS AND SOCIOLOGY**, Vol. I, No. 1, Oct., 1941—*American Journal of Economics and Sociology, Inc.*, Quarterly, \$3. See page 345.

*Science News Letter, November 29, 1941*